BUREAU OF RECLAMATION

Colorado River Basin 2007 Interim Guidelines SEIS

IBWC Colorado River Citizens' Forum

January 18, 2023

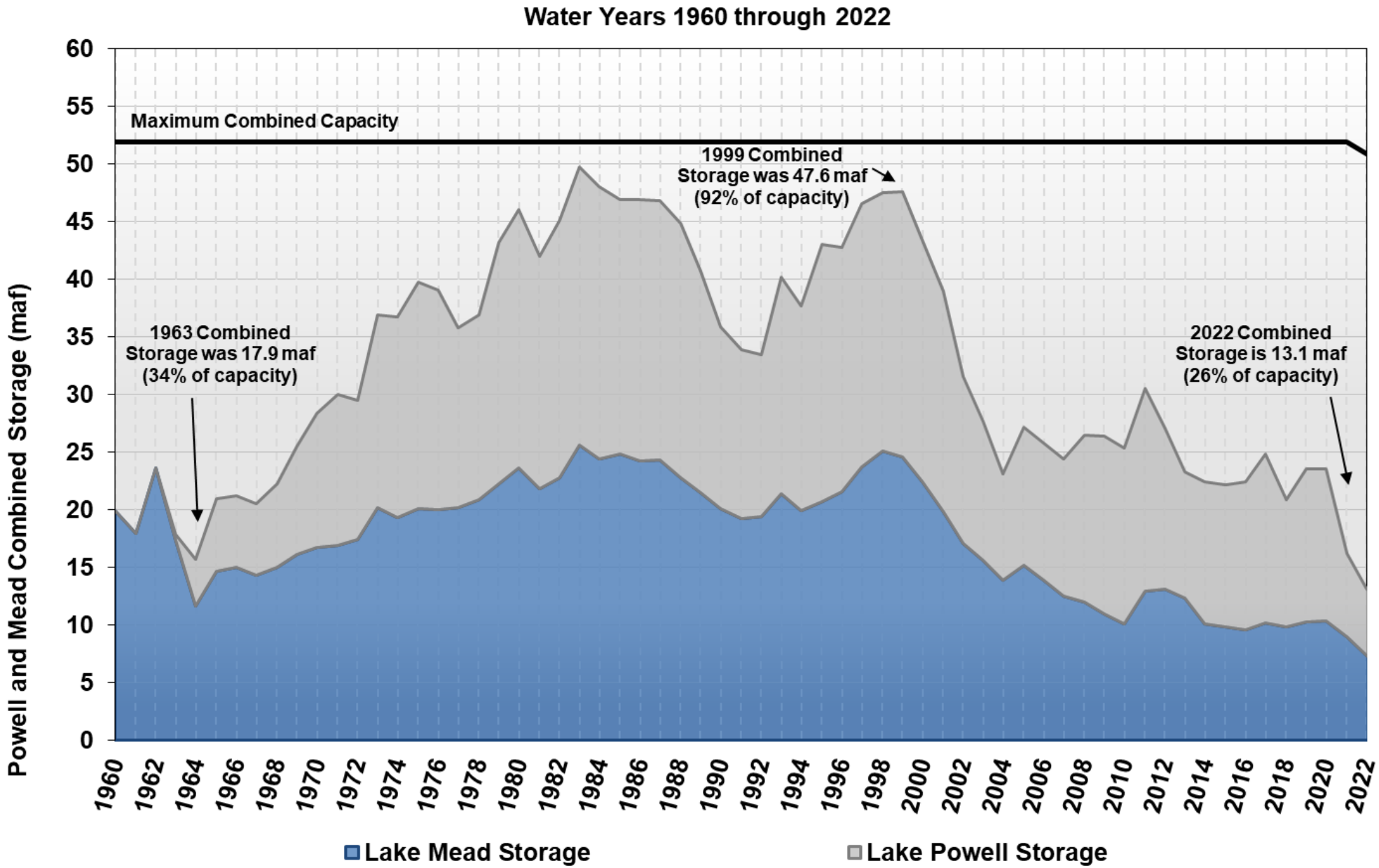
Outline

- Provide Colorado River hydrology updates
- Summarize purpose of the Notice of Intent to Prepare a Supplemental Environmental Impact Statement (SEIS) for December 2007 Record of Decision Entitled Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead published in the Federal Register on November 17, 2022 (87 FR 69042)
- Present a range of hydrology and operational scenarios that will inform the SEIS analysis
- Provide an overview of potential alternatives currently being considered
- Provide information on the SEIS schedule

Colorado River Hydrology Updates as of December 2022

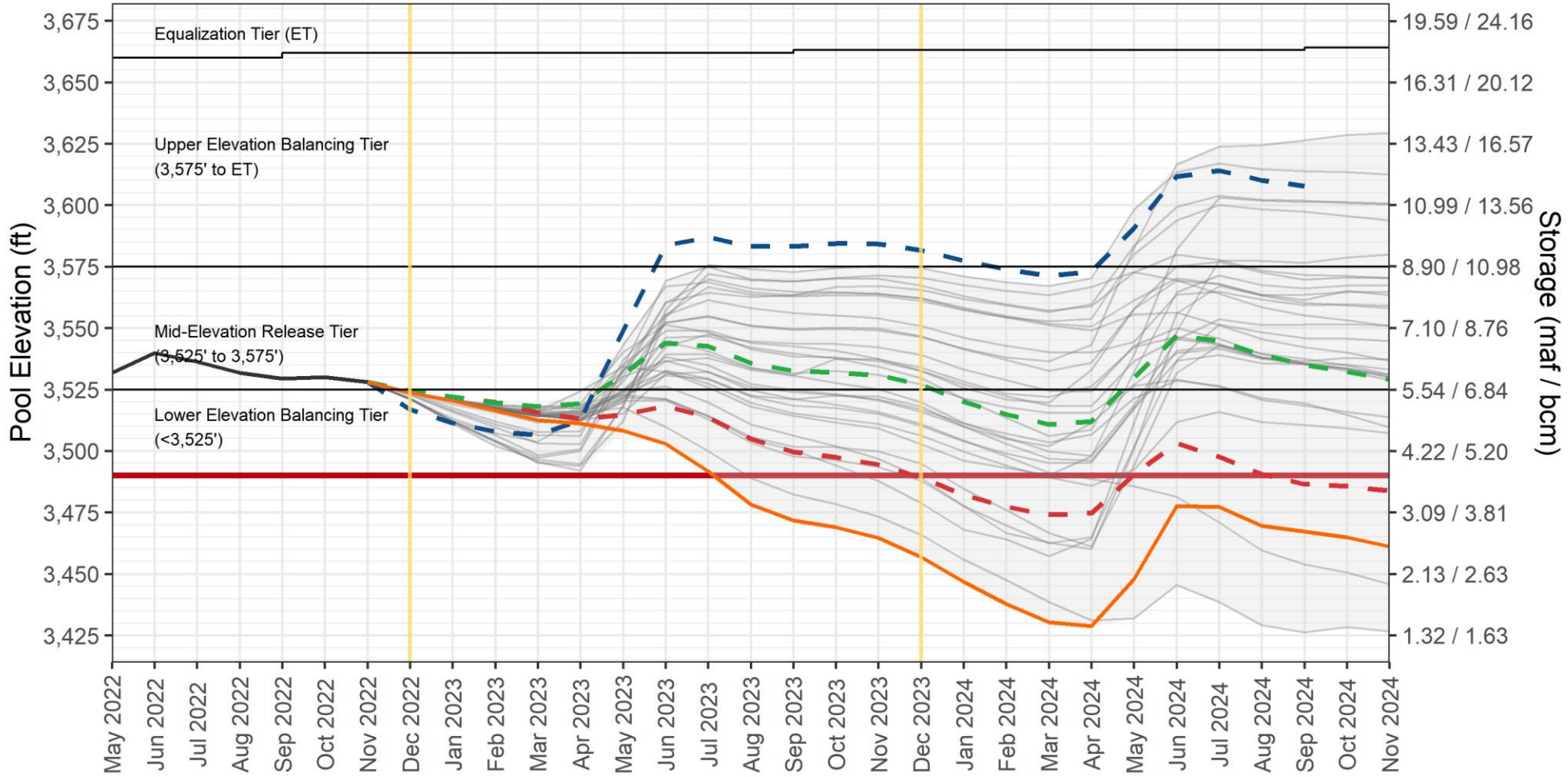
The following slides show key elevations and associated scenarios at Lake Mead and Lake Powell based on the Colorado River Mid-term Monitoring System (CRMMS) Projections from October and December 2022

Lake Powell and Lake Mead End of Water Year Storage



Lake Powell End-of-Month Elevations[1]

Colorado River Mid-term Modeling System (CRMMS) Projections from October and December 2022



December 2022 DROA 24-Month Study Probable Minimum

October 2022 24-Month Study Probable Maximum

December 2022 24-Month Study Most Probable

Historical

CRMMS-ESP Projections
(30 projections)

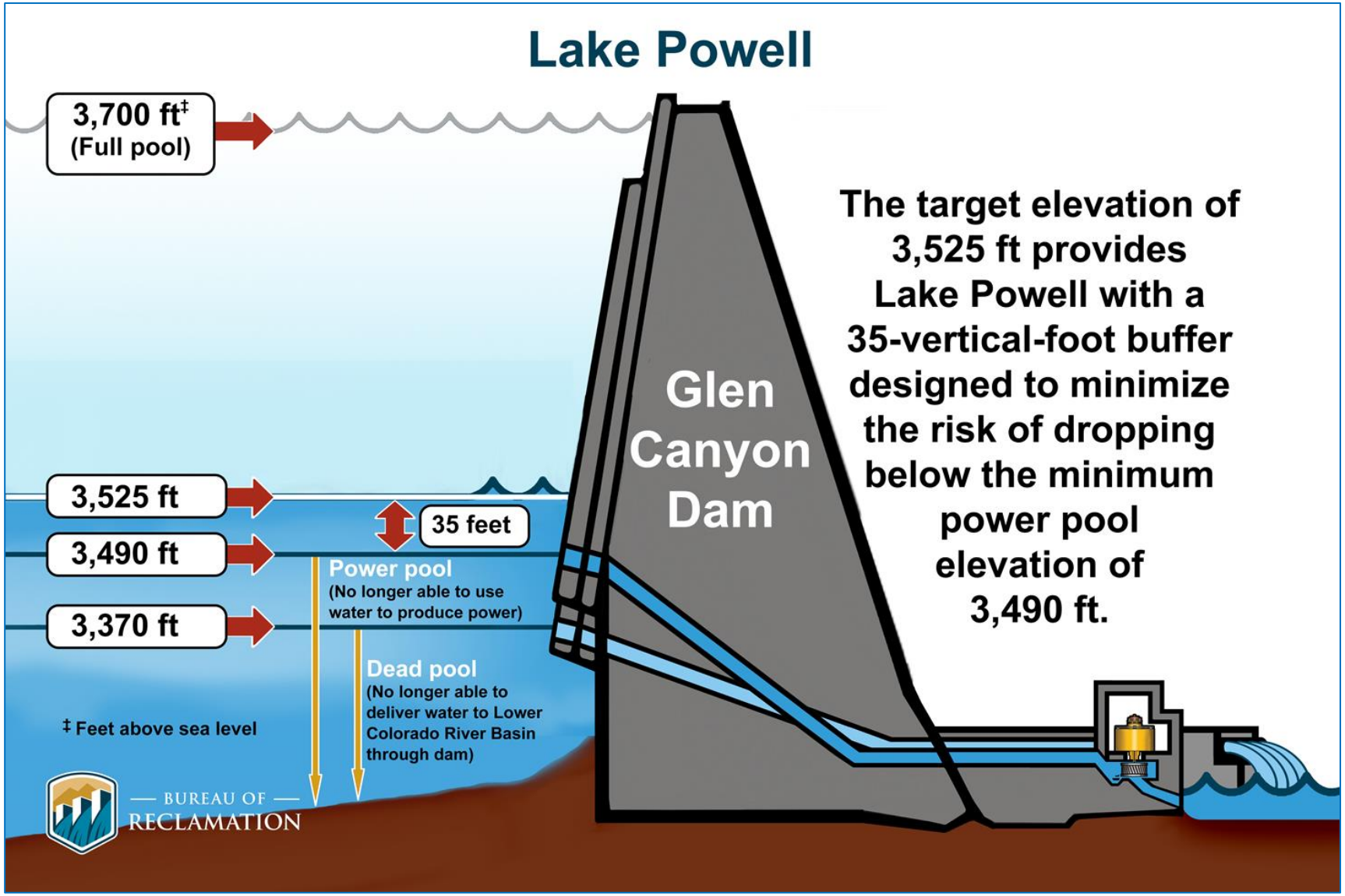
2002-2003 hydrology

CRMMS-ESP Projections Range

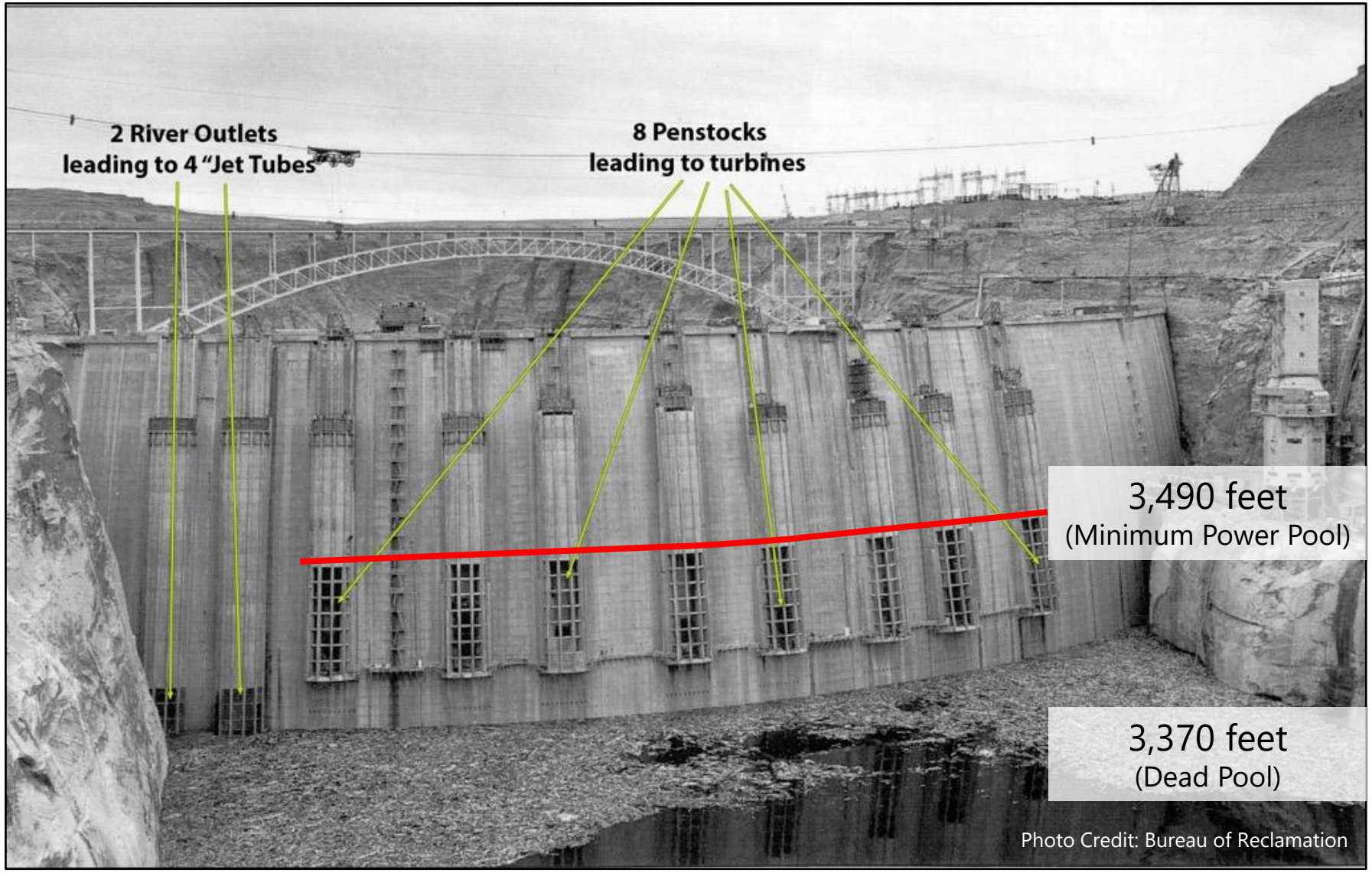
[1] Projected Lake Powell end-of-month physical elevations from the latest CRMMS-ESP and 24-Month Study inflow scenarios.

BUREAU OF RECLAMATION

Lake Powell Key Elevations

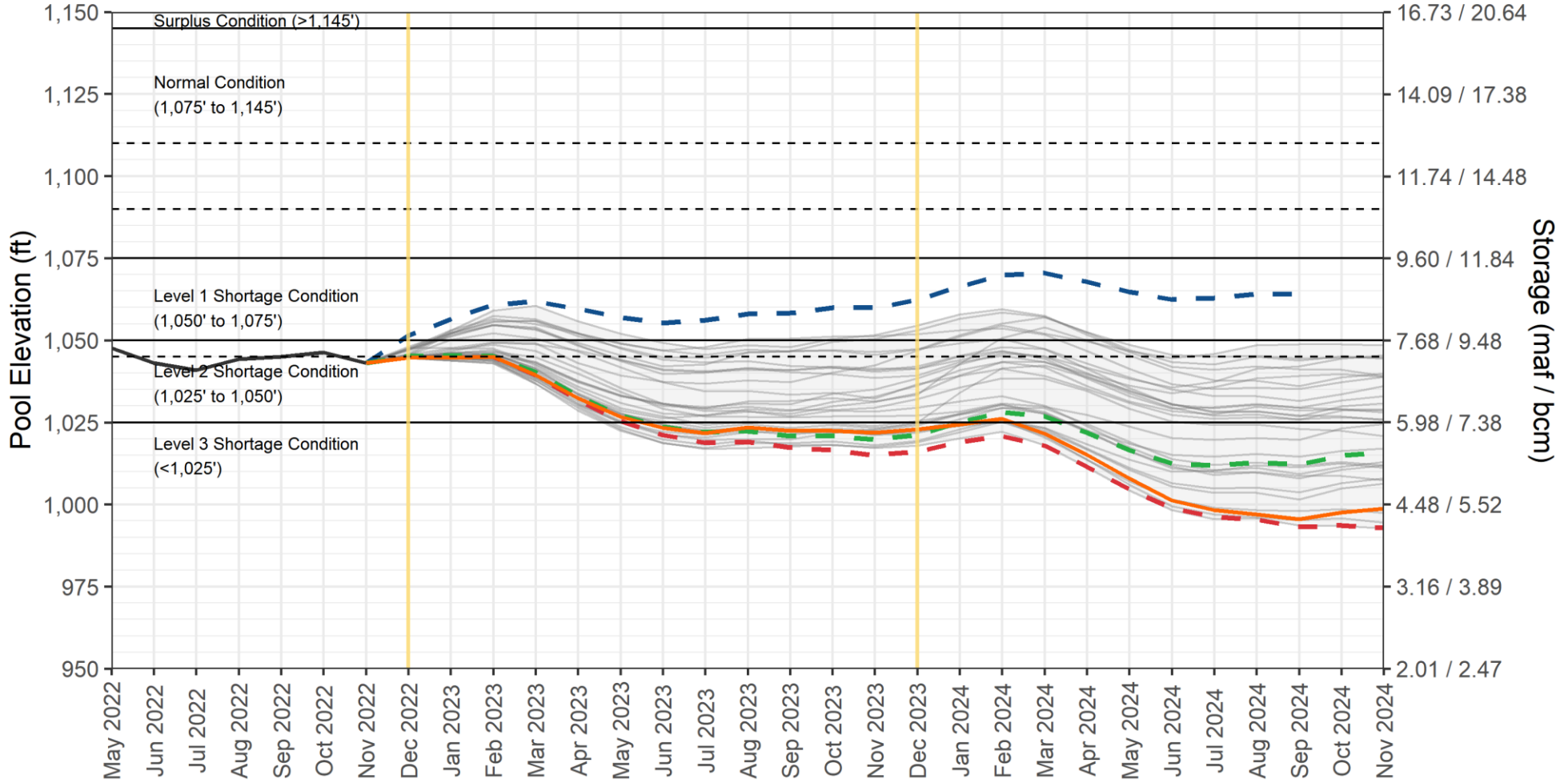


Glen Canyon Dam - November 21, 1963



Lake Mead End-of-Month Elevations[1]

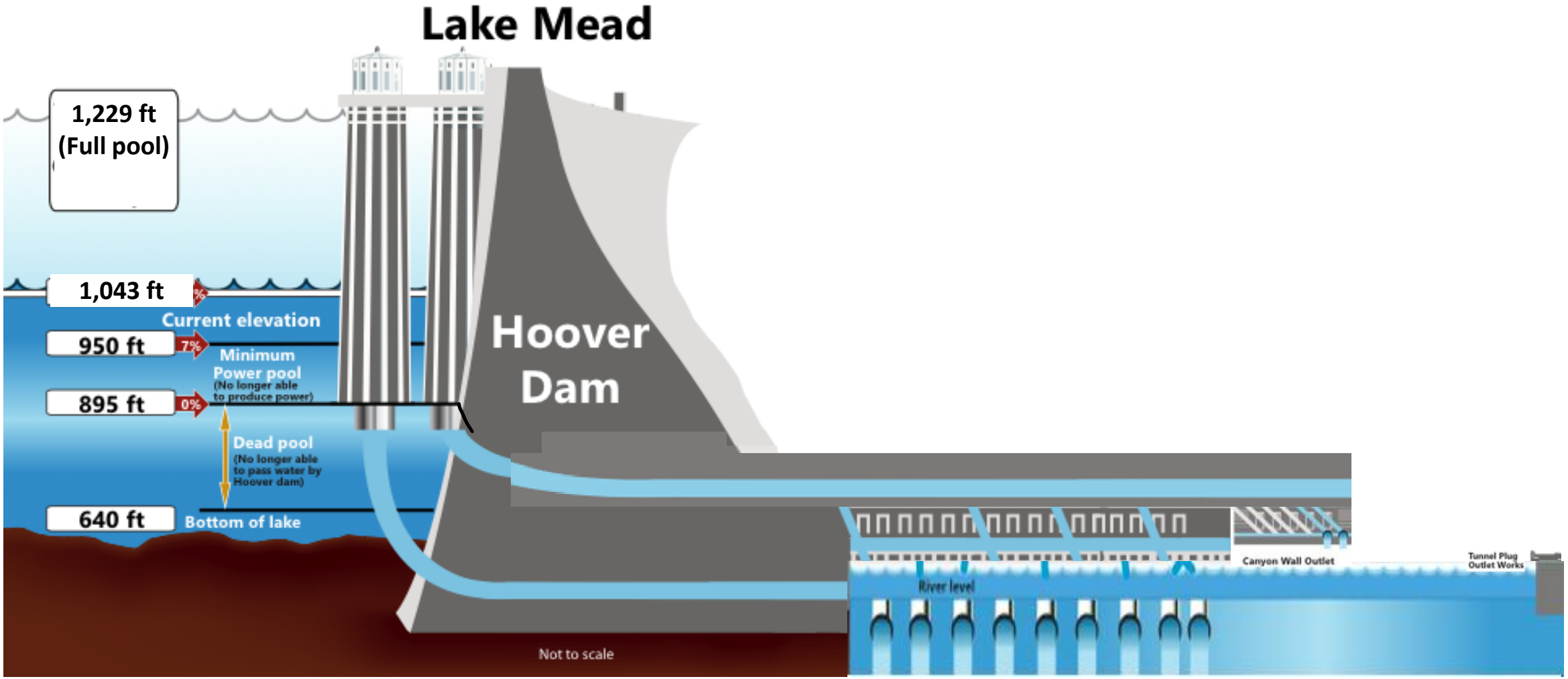
Colorado River Mid-term Modeling System (CRMMS) Projections from October and December 2022



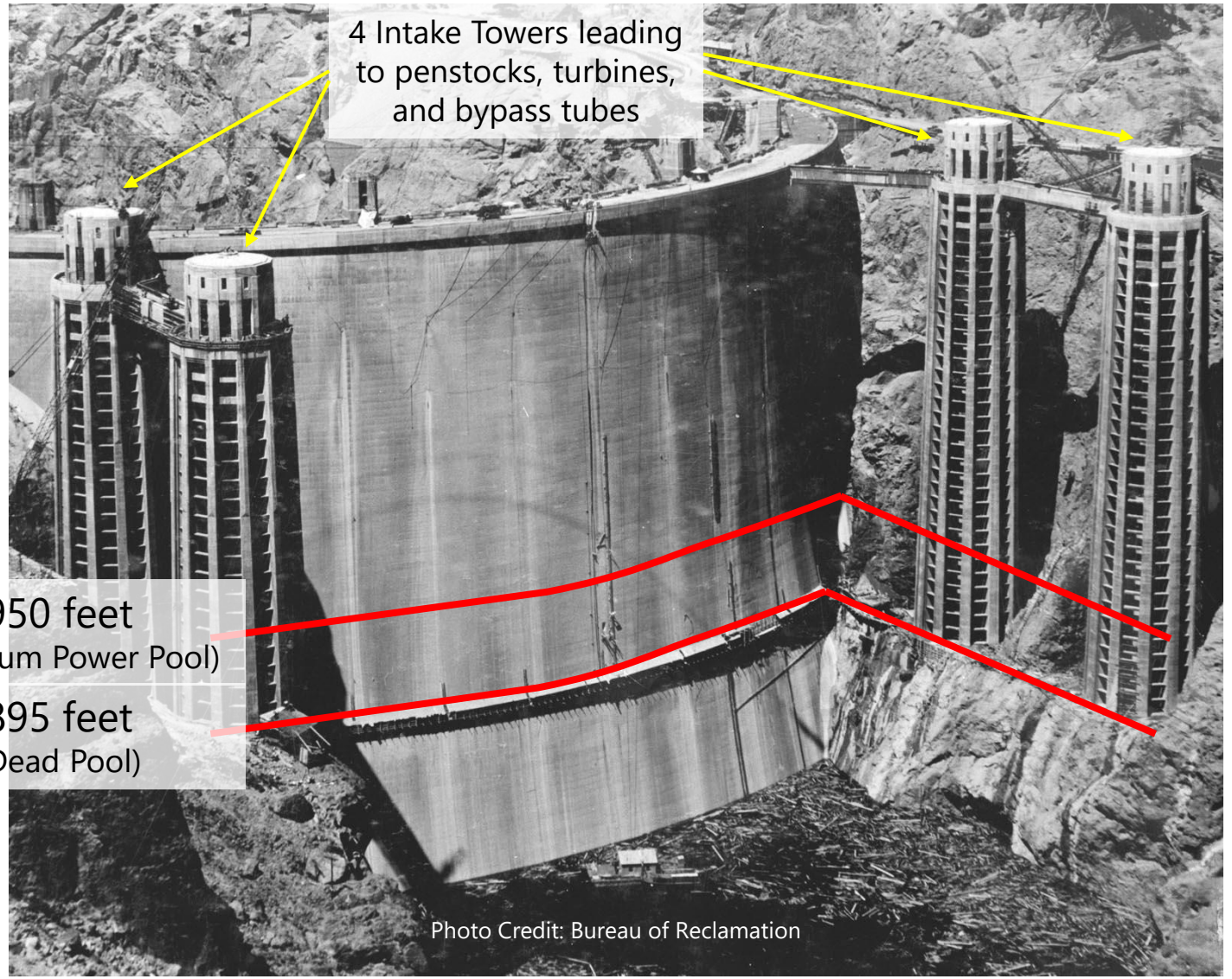
[1] Projected Lake Mead end-of-month physical elevations from the latest CRMMS-ESP and 24-Month Study inflow scenarios.

BUREAU OF RECLAMATION

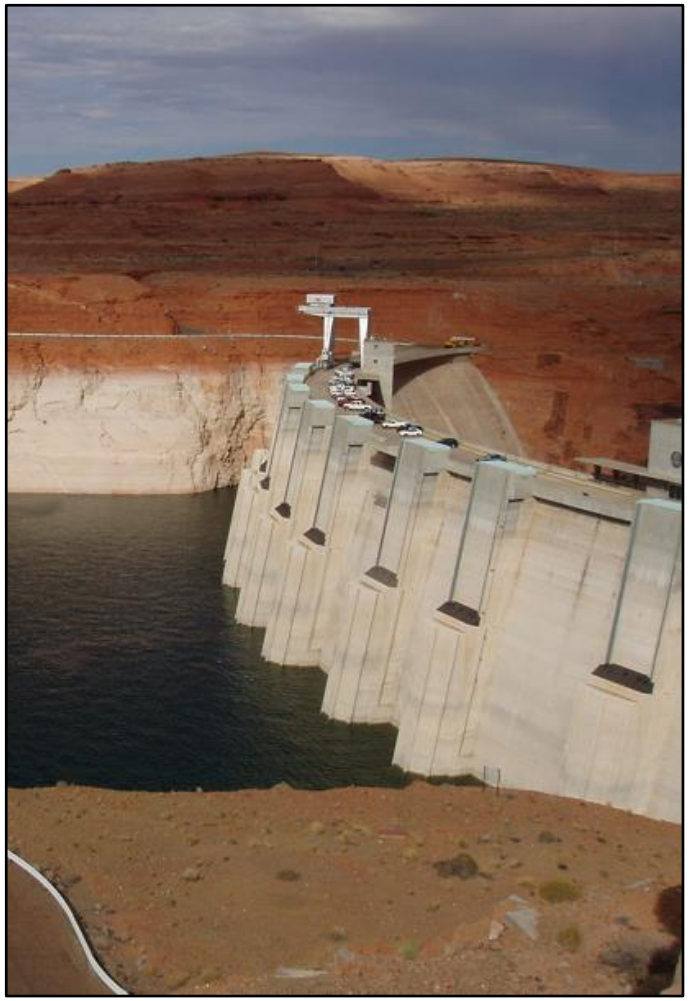
Lake Mead Key Elevations



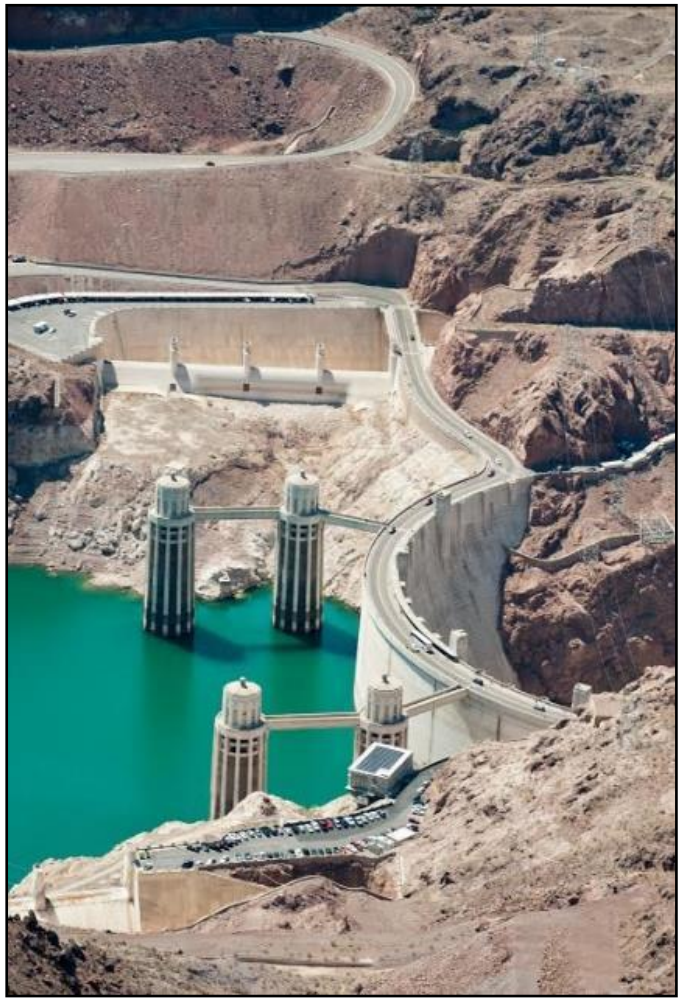
Hoover Dam – May 27, 1935



Colorado River – Current Conditions
(as of December 7, 2022)



Lake Powell near Glen Canyon Dam



Lake Mead near Hoover Dam

- Driest 23-year period on record (2000-2022)
- Low inflows 4 of the past 5 years (37 to 63% of average)
- Lake Powell and Lake Mead at historically low water levels
  - Lake Powell current elevation is 3,528 feet at 24% of capacity
  - Lake Mead current elevation is 1,043 feet at 28% of capacity

Purpose of the Federal Register Notice

- Critically-low current reservoir conditions and potential impacts of low runoff conditions in the coming winter (2022-23) pose unacceptable risks to operations of Glen Canyon and Hoover Dams
- Accordingly, modified operating guidelines need to be expeditiously developed through a Supplemental Environmental Impact Statement (SEIS) to inform operations in 2023-24 (and perhaps 2025-26)
- Formally announced the request for input by December 20, 2022
- Does not interfere with the separate post-2026 guidelines development process

SEIS Low-flow Hydrology & Operational Scenarios

The following slides on low-flow hydrology and operational scenarios do not show alternatives to be analyzed, but instead show scenarios and trade-offs related to protecting various elevations at Lake Mead and Lake Powell to be considered as alternatives are developed for analysis in the SEIS.

SEIS Modeling Scenarios

- Baseline – Official September 2022 CRMMS-ESP
- Protect 3,490′ at Lake Powell
  - Protect 3,490′ by reducing Powell's release each month during the water year (WY) so that Powell's elevation is at or above min power pool; method tries to release volume held back later in the WY
- Protect 3,490′ at Lake Powell and 950′ at Lake Mead
  - Protect 3,490′ by reducing Powell's release months during the WY so that Powell's elevation is at or above min power pool; the method tries to release volume held back later in the WY
  - Protect 950′ by reducing Mead's release each month so that Mead's elevation is at or above 950′; method does not try to release volume held back later in the calendar year (CY)
- Protect 3,490′ at Lake Powell until Lake Mead reaches 950′, then balance Powell and Mead storage with no minimum release
  - Once Mead reaches 950′, Powell will not protect 3,490′ and instead balance with no minimum release. After balancing, Mead will release balanced water downstream for Lower Basin and Mexico use.

Individual Streamflow Trace Analyzed: 2002-2005
Lowest Powell EOCY 2023 Storage in this 30-year period

- Ensemble Streamflow Prediction (ESP) trace uses climate (temperature and precipitation) timeseries from 2002-2005
  - 2023 ~ 2002 climate
  - 2024 ~ 2003 climate
  - 2025 ~ 2004 climate
  - 2026 ~ 2005 climate
- 80% of the ESP 2002-2005 streamflow trace is used to provide a lower trace than available in ESP

Lake Powell WY Unregulated Inflow

	2023	2024	2025	2026
% of Avg. (1991-2020)	24%	58%	61%	125%
WY Volume (kaf)	2,350	5,610	5,820	10,750

80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

Lake Powell WY Unregulated Inflow

	2023	2024	2025	2026
% of Avg. (1991-2020)	24%	58%	61%	125%
WY Volume (kaf)	2,350	5,610	5,820	10,750

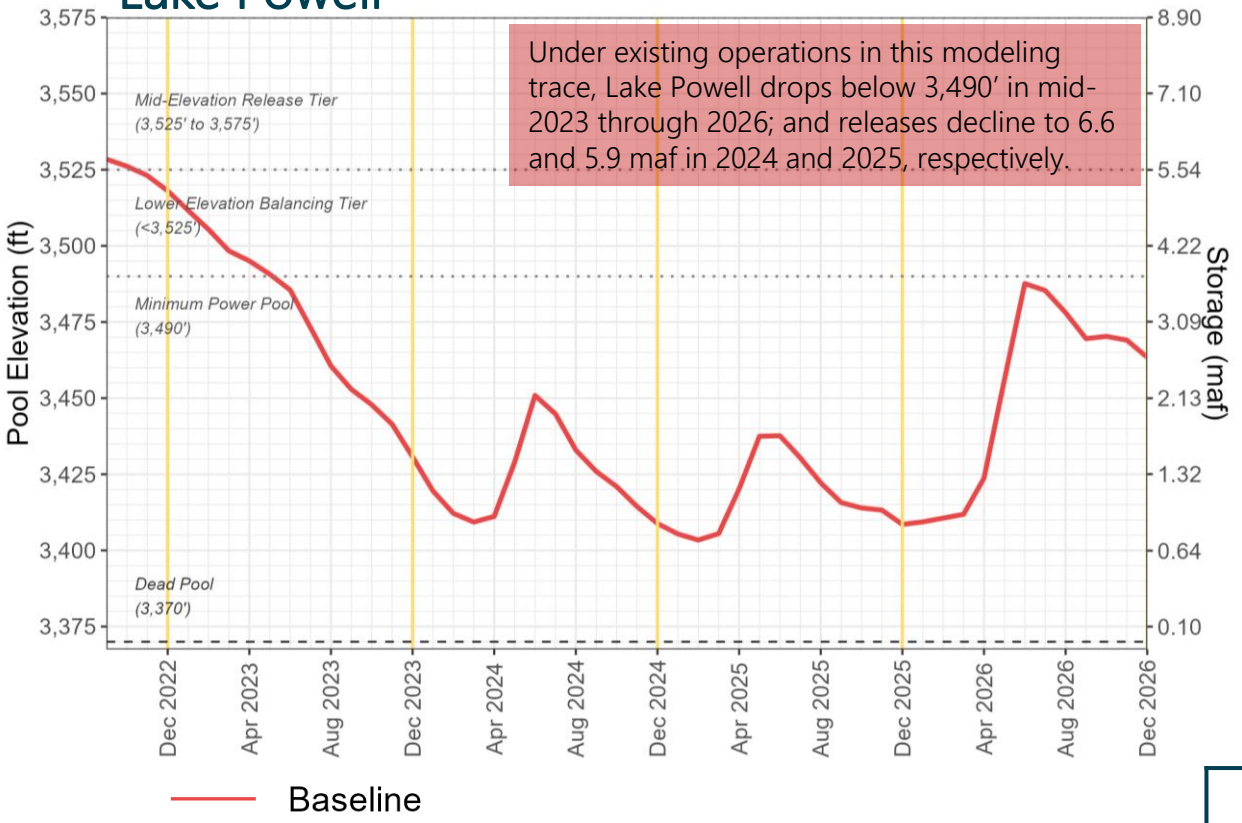
2023 is similar to:
2021 (3,500 kaf)

2024 and **2025** are similar to:
2020 (5,850 kaf) &
2022 (6,370 kaf)

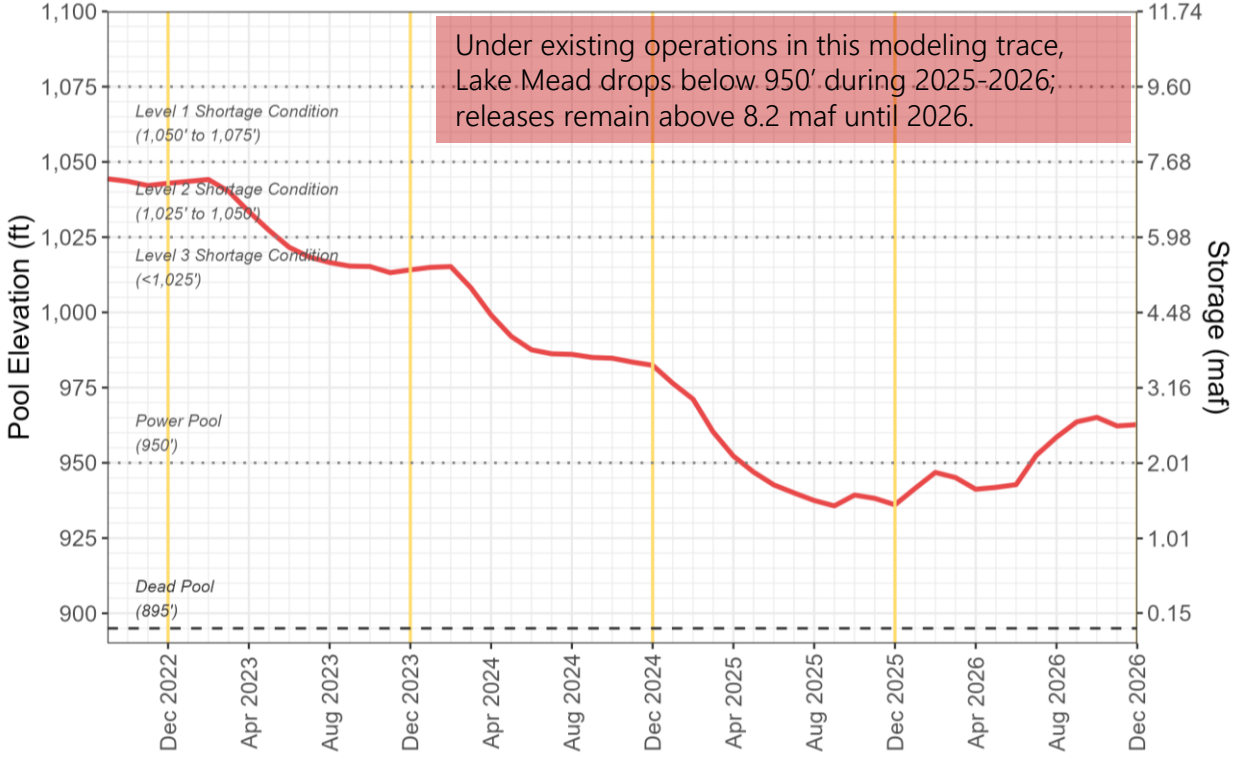
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



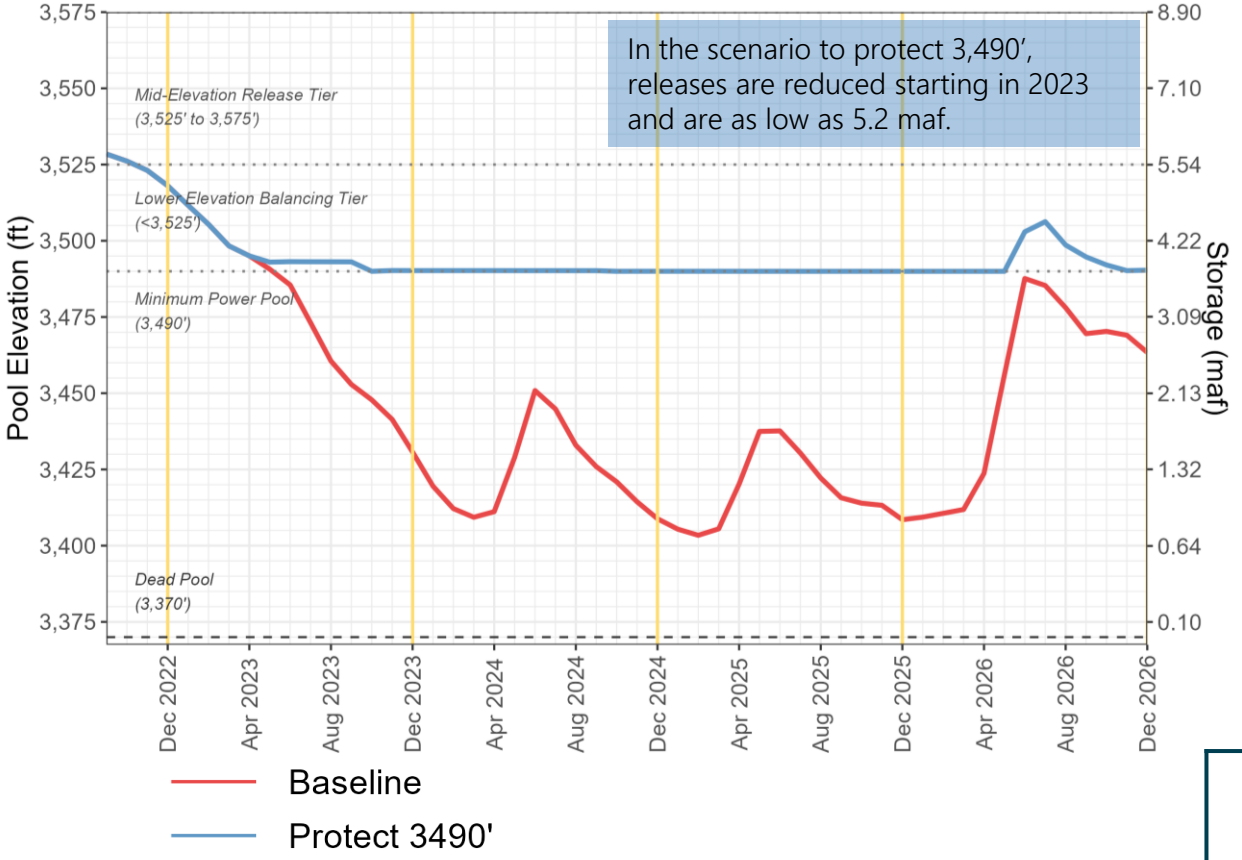
% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7

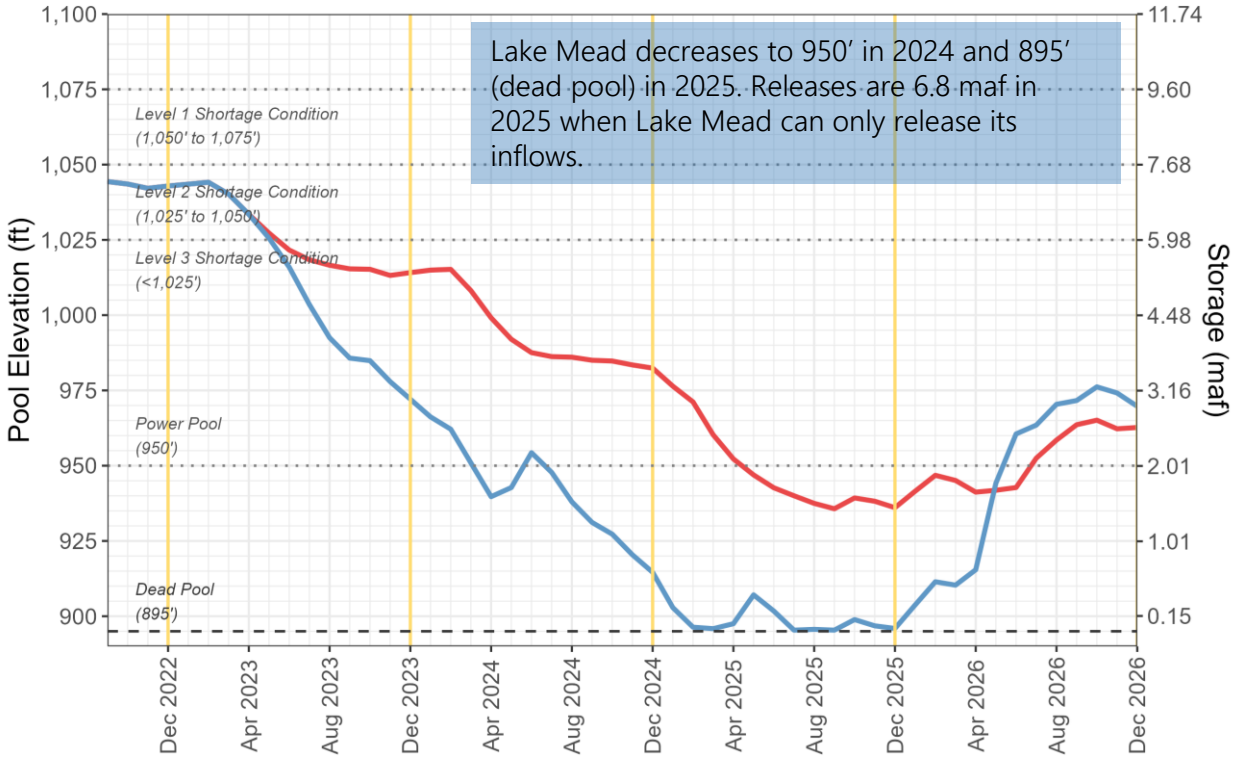
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



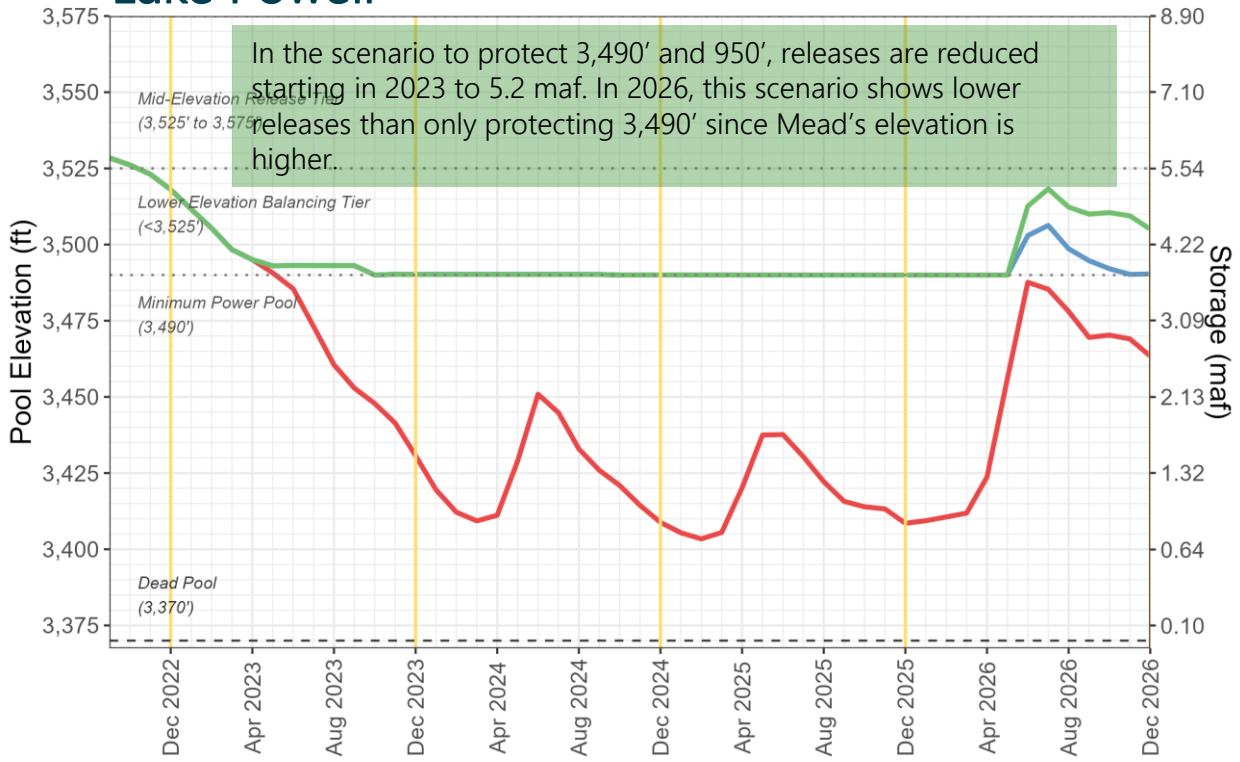
% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7
Protect 3,490'	5.2	5.7	5.5	9.2	82.6	80.9	77.4	77.6	8.7	8.2	6.8	7.7

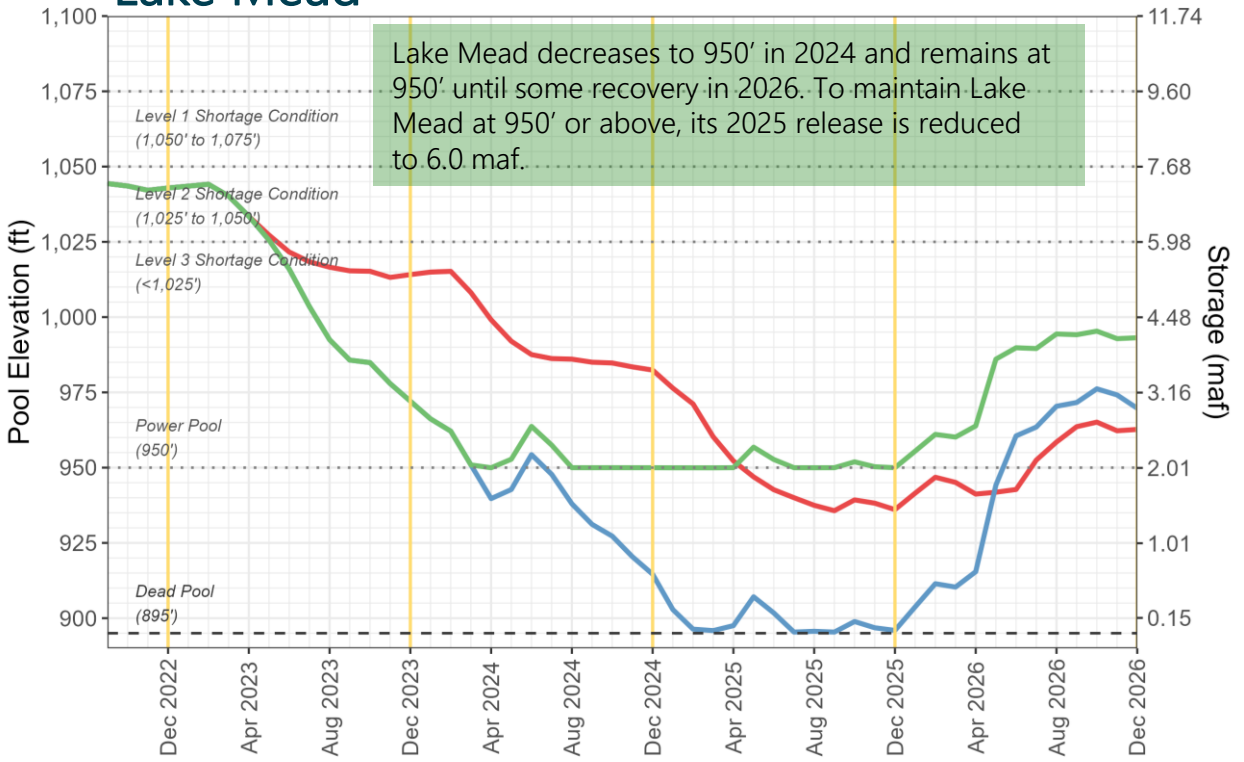
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



Baseline

Protect 3490'

Protect 3490',950'

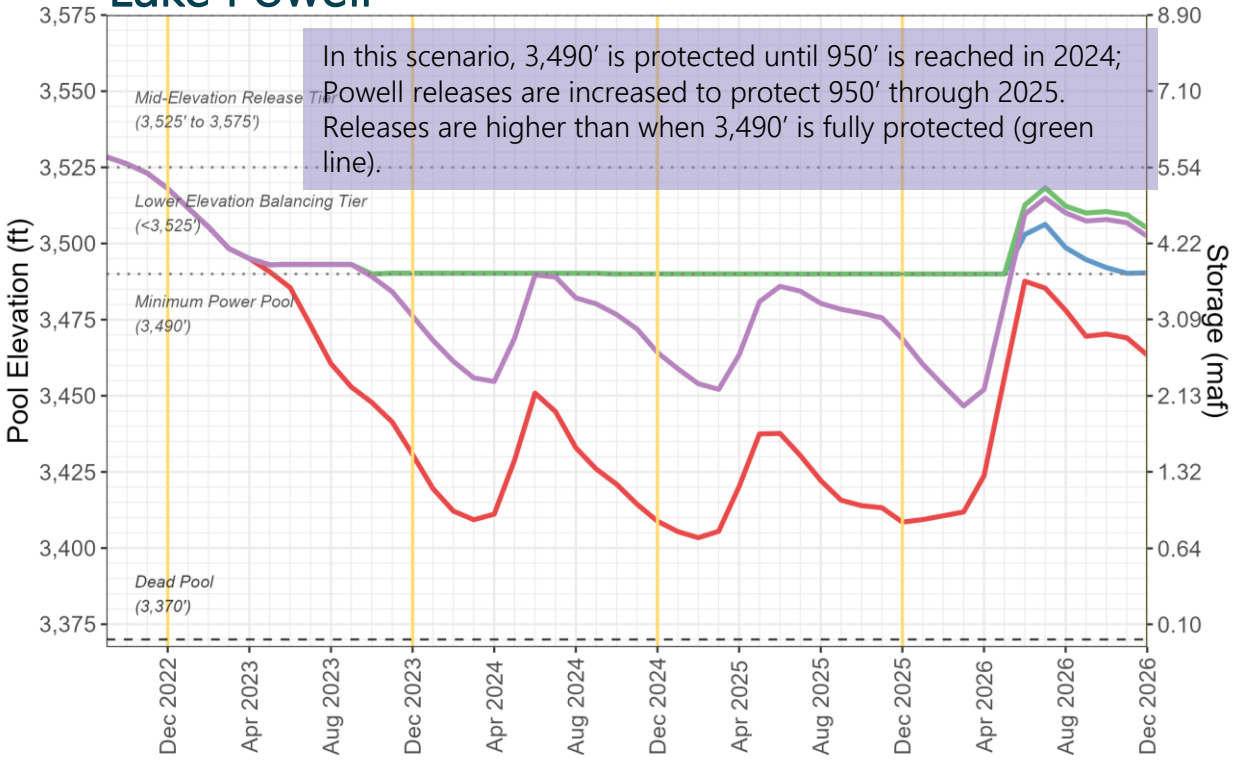
% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7
Protect 3,490'	5.2	5.7	5.5	9.2	82.6	80.9	77.4	77.6	8.7	8.2	6.8	7.7
Protect 3,490', 950'	5.2	5.7	5.5	8.4	82.6	80.9	77.4	76.8	8.7	6.7	6.0	7.7

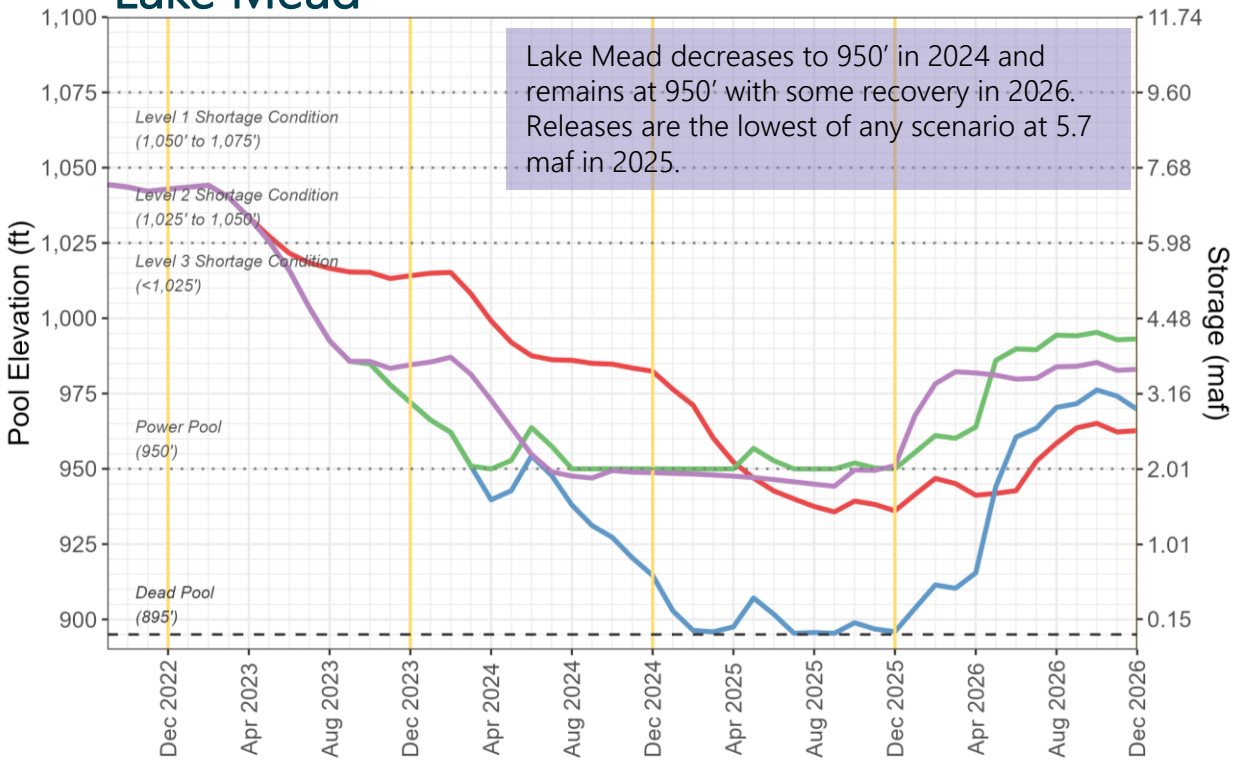
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



- Baseline
- Protect 3490'
- Protect 3490',950'
- Protect 3490',until 950' is Reached

% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7
Protect 3,490'	5.2	5.7	5.5	9.2	82.6	80.9	77.4	77.6	8.7	8.2	6.8	7.7
Protect 3,490', 950'	5.2	5.7	5.5	8.4	82.6	80.9	77.4	76.8	8.7	6.7	6.0	7.7
Protect 3,490', until 950'	5.2	6.2	5.6	8.0	82.6	81.4	78.0	77.0	8.7	8.0	5.7	7.5

SEIS Preliminary Alternatives

- No Action
  - Continued implementation of existing agreements that control operations of Glen Canyon and Hoover Dams
- Framework Agreement Alternative
  - Additional consensus-based actions that build on commitments and obligations developed by the Basin States, Tribes and non-governmental organizations as part of the 2019 DCPs
- Reservoir Operations Modification Alternative
  - A set of actions adopted pursuant to Secretarial authority under applicable federal law; could complement a consensus-based alternative that may not sufficiently mitigate current and projected risks to Colorado River System reservoirs

No Action Alternative

- Continued Full Implementation through 2026 of:
  - 2007 Interim Guidelines for operation of Lake Powell & Lake Mead
  - 2017 Minute 323 with Republic of Mexico
  - 2019 Drought Contingency Plan Contributions for Lower Basin States (AZ, CA, NV)
  - 2019 Drought Contingency Plan for the Upper Basin
  - 2019 Binational Water Scarcity Plan with Republic of Mexico

Anticipated Impacts of No Action

- Critically low elevations at Lakes Powell and Mead
- Water delivery and operations limitations
- Loss of hydropower production
- Flow limitations in the Grand Canyon
- Limited flows for ecological programs
- Reduced water availability to water users basin-wide
- U.S.-Mexico Water Treaty obligation

Framework Agreement Alternative overview

- An additional consensus-based set of actions that would build on existing commitments and obligations developed by the Basin States, Tribes, and non-governmental organizations as part of the 2019 DCP
- Reclamation would analyze any Framework Agreement Alternative in light of drier hydrology and extreme low flow scenarios
- Reclamation is analyzing scoping comments to help develop a framework agreement alternative and will continue to work with stakeholders

Framework Agreement Alternative components

- Could include issues, that respond to extreme low-flow conditions, such as:
  - What elevations might be protected in Lake Powell and Lake Mead
  - How much water might be released from Lake Powell
  - How much water might be released from Lake Mead
  - How shortages might be defined for Lower Basin States

Components of Reservoir Operations Modification Alternative

Considering protecting critical infrastructure and the range of potential poor hydrology, Reclamation could, for example, propose to:

- Protect elevation 3,500' at Lake Powell & elevation 1,000' at Lake Mead
  - Section 2D. Raise operating determination elevations and/or increase shortage reduction amounts in Lower Basin by as much as 2 maf (or more)
  - Section 6C. Release less than 7.0 million acre-feet (maf) of water from Lake Powell - initial estimates are to analyze releases reduce by 2 to 3 maf (or more)
  - Section 7C. Provide for potential mid-year reductions in the Lower Basin

Overview of SEIS NEPA Schedule

- Federal Register published November 17, 2022
  - Scoping comment period closed on December 20, 2022
- Anticipated Draft Supplemental EIS available for public review in Spring 2023
- Anticipated Final Supplemental EIS available for public review late Summer 2023

Questions?


For more information visit:
https://www.usbr.gov/ColoradoRiverBasin/SEIS.html